

## Light Scattering In Aqueous Solutions of Carboxylic Acids

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The study of well-known, and a search for new, binary aqueous systems possessing structural fluctuations as observed in alcohol-water solutions at small concentrations of the nonaqueous component (0.02-0.15 mole fraction) is of great practical consequence since most biological and some chemical processes occur at small concentrations of compounds in water. In alcohol-water and in nonelectrolyte-water binary systems studied by different methods [1-4], a rise of concentration fluctuations which are named as structural fluctuations of concentration has been observed. They have been interpreted [1,5-7] by incalculation of nonelectrolyte molecules in friable water structure and by clathrate structure formation [6] of two types as enriched by water molecules so enriched by nonelectrolyte molecules.

We studied solutions of carboxylic acids in water by the Rayleigh light scattering method. For an isotropic light scattering intensity at 20°C, the concentration fluctuation maxima are observed in acetic acid-water at  $x_1=0.06$  and  $x_1=0.12$  mole fraction, in pro-pionic acid-water at  $x_1=0.02$  mole fraction, and in butyric acid-water at  $x_1=0.05$  mole fraction of acids. Maxima in the first system are clear, and in the last two system are weak. The maxima intensities in all systems decrease as the temperature of solution increases.

These anomalies may be interpreted according to the model mentioned above. For the breaking water friable structure the rupture of a considerable amount of hydrogen bonds between water molecules takes place and the conditions for hydrate clathrates of different composition are produced that lead to concentration structural fluctuations.

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